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AUTHOR Aitken, Joan E.
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ABSTRACT

A study examined how W. Stephenson's Q-methodology can be used as an instructional technique in teaching speech communication. The method was applied to an undergraduate communication theory class of 14 students who constructed, completed, and analyzed their own 59-item Q-sort about principles of communication theory. The process, which identified the "typical communicator" and the "nonverbal communicator," required that the students make choices about their values and feelings about communication theories and enabled them to compare their responses to those of their classmates. A second class developed a 44-statement Q-sort on computer apprehension that was administered to 63 people and that identified the "computer enthusiast," the "user skeptic," and the "talker," i.e., the way computers change communication among people. Results on course evaluations revealed that students considered the use of Q to be a valuable and interesting learning tool. Students indicated a strong sense of accomplishment in creating their own study in which they collected data, analyzed information, and evaluated results. (Three tables are included, student instructions are appended, and 39 references are attached.) (KEH)

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Using Stephenson's Q-Methodology in Teaching Communication Theory

Joan E. Aitken

University of Missouri--Kansas City

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Abstract. The purpose of this paper is to explain how Stephenson's Q-methodology can be used as an instructional technique in teaching speech communication. The method is applied to an undergraduate communication theory class of 14 students who constructed, completed, and analyzed their own 59 item Q-sort about principles of communication theory. A two factor solution indicated a "typical communicator" and a second type that emphasized the importance of nonverbal communication. A second class developed a 44 statement Q-sort on computer apprehension that was administered to 63 people.

Author Identification. Joan E. Aitken (Ed.D., University of Arkansas-Fayetteville) is an Assistant Professor in the Department of Communication Studies, 5100 Rockhill Rd., University of Missouri--Kansas City, Kansas City, MO 64110-2499 (telephone 816-276-1698). A preliminary analysis of these data was delivered at the 1989 conference of the National Association for Humanities Education, Kansas City, MO.

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Using Stephenson's Q-Methodology in Teaching Communication Theory

In the summer of 1989, several dozen researchers from around the United States gathered together to celebrate the life and mourn the loss of William Stephenson. Not only had Stephenson made a major contribution to communication theory through his own writings, but his invention of Q-methodology provided a unique way to study human subjectivity through language. Q-methodology has demonstrated its effectiveness in some 1500 research studies since its conception over fifty years ago (Brown, 1986a, p. 72). Although originally designed for research in the field of psychology, the method has received widespread use across many disciplines. Because of Stephenson's training in both the physical and behavioral sciences--a Ph.D. in physics and a Ph.D. in psychology--he developed a method to combine the fields by enabling scientific study of subjective mental processes. As Brown (1986a) wrote: "The first axiom of Q methodology is that it is the subjective self (a primitive and undefined term) that is at the center of all meaning." The concern is for "states of mind" rather than "observables in states" (p. 73). Since his landmark work in psychology, The Study of Behavior (1953), Stephenson advocated using Q-methodology in many different contexts.

Although Q-methodology has proven itself effective in many types of research (McKeown & Thomas, 1988), it also enables a creative approach to instruction. At the annual Institute for the Scientific Study of Subjectivity in 1988, Stephenson applauded this recent trend to use and develop Q-methodology as an instructional technique (e.g. Aitken, 1988; Wattier, 1988-89). In a "nutshell," Q-methodology is a set of procedures that can be used in studying one's intrapersonal structure of opinions about a given topic. Whether or not the teacher grounds the measure (Q-sort) in theory, the data suggest an explanation by indicating person-types (prototypes) of thinking patterns by using the principles of factor analysis.

The instrument used in Q-methodology, the Q-sort, is different from most paper-and-pencil measures, in that the respondent sorts statements (pictures or other materials) according to an agree--disagree (pleasure--unpleasure) continuum. Instead of responding with one's degree of agreement to each statement, the respondent sorts each statement to be placed on a grid that shows the relationship between statements. The method seems particularly suited to communication education by:

1. Teaching Communication Skills and Theory. Students can improve their communication skills as they conduct interviews to collect statements for the Q-sorts. The measure is based on the theory that people have a commonality in the way they use language.
2. Analyzing Thinking Patterns. The technique allows student self-discovery. While students complete their Q-sorts, they must sort their feelings and ideas about a topic. They are required to think about their perspectives. In addition, when they analyze the results students must also consider the processes of how they think.
3. Making Comparative Analyses. When students are allowed to examine their thinking patterns, they also can make comparative analyses between their thinking and the thinking processes of

others. Not only can students consider their own thoughts, but they can enlist the help of family and friends in completing Q-sorts, so that responses can stimulate discussion about the topic at hand.

4. Structuring One's Subjective Intrapersonal Communication Processes. Students cannot easily ponder their thinking processes and come to new understandings. Q enables a structuring of one's intrapersonal communication processes. As Brown (1986a) clarified, a person's "viewpoint [will] remain implicit (that is, present but undetected) unless provided with some instrumental medium, such as a Q-sort, for transforming it into a manifestation" (p. 73). Regarding their understanding of cognitive processes, students may be unaware of their intrapersonal processes, and the existence and influence of stimuli (Nisbett & Wilson, 1977, p. 231). Thus, Q-methodology can enable the student to discover feelings and patterns he or she cannot discover in other ways.
5. Allowing Theoretical Study. Although Q-sorts are generally constructed according to a certain theme, their foci may be narrow or broad. If using Q-methodology, students can test theories they are studying to see if their thinking processes support the theories.

The purpose of this article is to explain the basics of how Q-methodology can be used as an instructional technique in teaching speech communication. While describing Q-methodology, the author will discuss issues of applying the instructional technique through an example taken from an undergraduate course in communication theory.

Background

Scholars have already acknowledged the value of teaching students about scholarly research methods. Frey and Botan, for example, (1988) advocated that undergraduate students can and should receive instruction in research methods at the undergraduate level. In her article urging the involvement of students in research projects, Hocker Rushing (1984) wrote: "The method of employing students in the research design is particularly well-suited to producing both depth and breadth" (p. 368). Students seem to benefit from learning about the research technique and studying a concept related to course instruction. As Hocker Rushing explained about using students to conduct research:

> Even if the study is not ultimately published, a strong advantage of turning students into qualitative researchers is that they simultaneously learn research methods and application of theoretical concepts in naturalistic settings. It is precisely this simultaneity that is important. When students discover firsthand that "Research" is simply a sophisticated form of observation and analysis, they begin to de-mystify the process, and to understand its place in the larger educational arena. In the experience of this author, their excitement about the subject matter increases, and their resentment towards professors' research projects decreases.

In the first undergraduate communication theory course taught by this author, Q-methodology enabled a unique approach to instruction. The problems of teaching the course for the first time, dealing with abstract material, and the study of varied--sometimes contradictory--theories could

be approached through the structure of a communication theory Q-sort. Six educational objectives and general steps regarding Q-methodology were presented to students (see appendix 1).

Particularly relevant to using Q-methodology in communication instruction is that it incorporates into its philosophical underpinnings the importance of language in our culture. The idea is that the way we talk about a given subject defines our perception of that subject. The most typical approach is to acquire statements by interviewing people. Using their everyday language, we have a vehicle that manifests their culture. Thus, in a sense, Q-methodology is a communication methodology of research. The basis of Q is founded on communication processes because the Q statements represent language common to the people involved. After completing one Q-sort, for example, a respondent said: "I've never done one of these kind of tests in which the language was so clear." The explanation for the "clarity" is that the statements are the wording of the people interviewed to compile statements for a Q-sort--not the researcher's or teacher's language--and thus the statements are normative in that sense. The measure is not normative from the standpoint that it will mean the same thing to everyone, but from the standpoint that the Q-sort statements should evoke meaning from everyone. The intention is that statements represent their culture, making the collection of statements the essence of effective use of Q-methodology.

Method

In this author's communication theory class, one Q-study was used throughout the course as a major element in helping students analyze communication theories: both in the language of experts and of the students. As an integral part of what could have been a tedious, complex, or confusing material, Q-methodology served as integral organizational element. A key purpose in designing and completing the Q-study was to enable students to recognize their personal theory of communication. The process required that they make choices about their values and feelings about communication theories and enabled them to compare their responses to those of their classmates.

Student Subjects In this illustration, fourteen undergraduate students enrolled in a communication theory class served as subjects for the study. In most behavioral research, scholars generally think that the larger the numbers the better the study. A large sample is not needed with Q-methodology, however, which makes it appropriate for use with a small class (Casey & Graham, 1988). The students are not used to generalize to a larger population, but instead are used to generalize to factors or person-types. As Brown described, the aim in Q is not "to generalize facts to broad populations, as a matter of statistical induction....It has always been the case in Q that generalizations apply to persons of the same type, irrespective of the numbers of persons belonging to the type" (Brown, 1986d, pp. 69-70). In other words, the factors themselves are generalizations. No one person thinks that way, the factor is the frame of mind. Although some Q studies use many subjects, most rarely use more than approximately 50 subjects. Kerlinger (1986) has suggested 60 to 80, and in fact, is often cited in discussions

of Q-methodology. Brown (1986b), however, has openly disagreed with Kerlinger, noting his failure to recognize Q-methodological developments over the past twenty years. Not only is a large sample unnecessary, it may result in a severe regression to the mean (resulting in a one factor solution). The method has demonstrated effectiveness in analyzing the "phenomenological world of the individual (or of small numbers of individuals) without sacrificing the power of statistical analysis" (Stephen, 1985, p. 193).

In Stephenson's discussion of "intensive analysis" he recommended using Q for single case studies. The idea here is to use only one (or few people) in the study, but to ask the individual to respond to the Q-sort under several conditions of instruction. A graduate class of five students, for example, could conduct a given Q-sort under several condition, such as: "How do you feel today?" "How would Aristotle sort these statements?" "What is the ideal way to sort these statements?" In teaching interpersonal communication, for example, Barchak (1984) has instructed students to sort statements under ten different conditions using a variation of the "Who Am I" exercise. Although the method has been used successfully for anything from one person to thousands of persons (Cataldo, Johnson, Kellstedt, Milbrath, 1970), Q-methodology is particularly successful with small numbers of subjects.

Apparatus. Before discussing the specific Q-sort in this study, the reader may find it helpful to consider the different ways that statements can be compiled for a Q-sort. In each case, the objective is to create a concourse of statements about feelings or opinions--not of fact--about a theme or issue. First, the teacher or students can collect a list of statements for a Q-sort using literature as the source of statements. The teacher or the students only need to think of an area to be studied, then the students can collect statements for an appropriate Q-sort. Some examples might include (a) statements taken from a communication textbook, (b) pictures of nonverbal communication, (c) quotations from major American speakers, or any other appropriate subject. From the collected concourse (group of statements), the teacher can compile the Q-sort, taking the most interesting, representative, thought-provoking, or simply random statements. In the Communication Theory class illustration, students were instructed to copy statements of opinion or feelings about communication theory that they found in their course textbook (Trenholm, 1986) or readings.

Second, the students can compile a list of statements for a Q-sort using interviews. In the class studying communication theory, for example, each student was assigned to interview a professional working in the field of communication. The objective was to discuss communication theory with the professional and obtain a list of at least ten statements from the interview. Students could also be assigned to interview faculty, friends, family, or anyone else suitable to the study of the topic under consideration. The teacher could give students a schedule for the interview, or allow students to be open-ended in talking about the topic (depending upon the direction desired by the teacher). Students can make recordings or use note-taking skills to compile interesting statements that represent the interviewees' feelings and opinions about the issue

under study. In this example, I spent two days teaching the concepts of interviewing and questioning. Then student were given a list of open-ended questions to stimulate their interviews. Thus, in the communication theory class example, statements were obtained from the literature and interviews.

Another way to obtain statements is from a focus group. Respondents may be asked to write down feelings about a particular topic, then discuss the topic in a small group. The advantage of this approach is the speed and ease in collecting statements. The variety of statements, however, may not be as large as those obtained from individual interviews.

Finally, statements can be collected from essays. Students may be instructed to write essays of their feelings about a particular topic. A teacher may, for example, assign a reading and require students to write an essay about their opinions and reactions to the reading.

Whatever method is used, the quality of the study will be based largely on the quality of the statements collected. The group of statements collected is the "concourse," from which a sample of statements is selected to use in the Q-sort. Stephenson, (1986b) indicated that "Q is based on communication and meaning as reflected in the concourse." While it may be useful to collect a large concourse of statements to use as a pool for the Q-sort, one generally stops with 400 statements "because of inherent limitations on variance in outlook in that many statements" (Casey & Graham, 1988, p. 3). By examining the nature of these statements, one can determine the elements that appear in the concourse that should therefore be included in the Q-sort or "sample."

After the compilation of a Q-concourse in this case, I selected 51 statements for use in a preliminary measure. In this instance, I utilized a variety of statements just as the students suggested them, without changing the agree-disagree balance, grammar, or content of statements.

Then the students were given the list of 51 statements and asked to respond on a five-point agree-disagree scale. Although this step had nothing to do with using Q-methodology, it was a quick way to give the students a chance to begin thinking about the statements that would be used in the Q-sort. This list was administered early in the course, and when I gave students their test results, students discussed the test as a group. Students continued to provide additional statements from their readings and interviews with communication professionals during the remainder of the course. I revised the list for the final Q-sort of 59 statements and gave the measure to 14 students in the class (a copy of the Q-sort may be obtained from the author). A quasi-normal distribution was used. Such forced-choice distribution on an eleven-point scale was commonly advocated by Stephenson (e.g. 1989, p. 181).

Insert Table One About Here

Although the grid for arrangement of Q-statements can be done in assorted ways, "the Q sort statements are conventionally arrayed in a forced, quasi-normal distribution" (Brown, 1986a, p. 59). The concern expressed about using a forced-choice grid has been whether or not people who apply their responses to a grid structure will be "made the same"

artificially. Instructing respondents to work from the two extremes toward the neutral-middle area, however, seems to solve that problem (see Brown, 1971). Although people may differ in their intensity of feelings about the statements and their agree-disagree balance, this procedure allows a viable method for each respondent. While a statistical case can be made for quasi-normal distribution (Stephen, 1985), "the forced distribution is a model (of the Law of Error) which is designed to help the Q sorter think about the problem" (Brown, 1986e, p. 66).

Most Q-sorts contain between 20 and 60 statements (Brown, 1987b, p. 98; Brown, 1986a p. 59). Although some researchers have recommended 40-60 statements, there are "hundreds of cases" of smaller Q samples, "many of which have been accompanied by highly reliable performances" (Brown, 1986d, pp. 69-70). The issue of ratio of Q sorts to the number of statements in the Q sample appears of little importance because in Q one does not know how many factors to expect (e.g. Brown, 1986c; Arrindell and Van der Ende, 1985).

Often researchers design the Q-sort to contain elements of a particular structure. A formal factorial design may be used, or an informal structure may be used that represents statements in proportions similar to their occurrence in the Q concourse (Brenner, 1988, p. 13). As Brown (1986a) explained:

> Statements in a Q sample, unlike items in a conventional rating scale, are not regarded as having a priori meaning, or as being valid measures of a characteristic or trait: Their placement in this or that cell of the design is provisional, and their selection in terms of the structure of the design is for purposes of constructing a Q sample that has the same breadth as the concourse that generated it. (p. 59).

No formal structure was used in the communication theory class example, other than that statements reflected different schools of thought studied in the course. The ideas of different communication theories, however, could be used to provide a structured Q-sort.

Generally, five factors affect <u>how complicated</u> the Q-sort will be: (a) its length, (b) the simplicity or complexity of the statements, (c) how familiar the respondent is with his or her ideas on the subject, (d) whether or not a theoretical structure is built into the measure, and (e) the individual's thinking patterns. As one student complained, "The last time I did one of your Q-sorts I worked on and off for two days." A relatively short and simple Q-sort, in contrast, can be completed in fifteen minutes. The abstract nature of many statements in the communication theory class example and the complex nature of the theoretical issues required considerable time and thought. The 59 statement Q-sort in the communication theory class example took most students between one and two hours to complete. Although the majority of people find the unique nature of Q-sorting fun to do, a long Q-sort can become tedious. The ability to discriminate levels of agreement accurately with large numbers of statements also raises certain questions. Although investigators may determine the exact size--of people and statements--based on the pilot study and needs of the specific research (Stephenson, 1967, p. 17-20), teachers will want to base the size of the Q-sort on the number of quality statements obtained from students and

adequate coverage of the ideas under study. "The key, as Stephenson has pointed out, is in the diversity of the concourse and in the Q sample which models it" (Brown, 1986c).

Procedure

When one considers the unique nature of Q-sorts, administrative concerns become apparent. The first administrative question is the physical preparation of the Q-sort. Each Q-sort is copied on paper or cardboard stock, then cut up into a stack of statements (papers or cards). Statements on pieces of card stock approximately 1 1/2 by 4 inches, for example, are easy to handle and sort. Those statements may be bound by a rubber band or placed in an envelope. The actual process of cutting the statements and preparing each Q-sort, however, is a time consuming one that may require many hours of work by several people. If the teacher uses small numbers of students or several small groups, considerable time can be saved because only a few Q-sorts are needed. Before Q-sorts are reused, each stack of statements should be shuffled, so that the arrangement of one respondent does not bias the arrangement of the next respondent who uses that Q-sort stack. Administration to a large group, on the other hand, increases the difficulty of making the Q-sort because so many more copies of the Q-sort are needed. When using Q-sorts in instruction, the teacher can have each student cut up his or her own Q-sort at home. Because students who decided not to cut up the statements would yield invalid data, the teacher can guard against such problems by having each student return the cut-up Q-sort in an envelope attached to the response form.

A second administrative problem is that respondents have difficulty finding their own errors in a Q-sort because of the time required to go back and check each statement. The teacher or the data entry person will need to double-check for respondent mistakes. One problem I experienced in using a computer printed Q-sort was that the appearance of number "36" and "38" were so similar that some respondents recorded "36" twice instead of both numbers. A second potential problem is that if respondents fail to separate statements once they record a number, they may record numbers twice. The teacher will want to warn students to return cards to their envelopes, for example, after each statement is recorded. One can generally correct such problems by looking at the content of responses to determine where the statements would most logically go, or by putting missing statements in the neutral-middle area. An occasional respondent mistake will not significantly alter the data.

A third administrative uncertainty occurs when the person does not follow directions because he or she lacks the ability or desire to do so. In contrast to many other research methods, however, these responses are relatively easy to detect. The respondents who fail to load on any type probably did not respond accurately on their Q-sort. In a study using children (Nitcavic & Aitken, 1988), the technique appeared ineffective with mentally retarded students. Apparently those students could not handle the complexity of the Q-sorting procedure. On the other hand, high school and college students seem adept and involved when sorting. That is not to say that factors with only one or two students should be ignored because they suggest "sabotaged" or inaccurate results. In fact, the

teacher and students will want to pay attention to all factors with two or more respondents loading significantly because those factors probably represent a unique--although perhaps less common--person-type. If there are two people on a factor, the factor is proof of reproducibility. Careful analysis of the statement array of such types will allow the teacher to determine if there is a coherent structure or random assignment of statements.

A final suggestion regarding administration is to provide a place on the answer sheet in which respondents can give some explanation why they selected their most strongly agree and disagree statement(s). Learning the rationales on a few statements can help the teacher and students in their interpretation of the results.

Results

First, it should be noted that a teacher may find it useful to create and administer a Q-sort without doing any statistical analysis. You have probably used self report questionnaire in class without comparing them to any normative data. The purpose of such measures are to stimulate the student's thinking and self-understanding. In the case of a Q-sort, the student cannot simply check off responses. Each student will ponder his or her responses while attempting to determine the structure or inter-relationship of ideas. At a recent meeting of Q-methodological researchers, someone asked the question: "Is Q-methodology a qualitative or quantitative method of research?" Several people immediately called out: "Yes!" Although Q-Methodology uses a quantitative procedure, some researchers believe it is a qualitative method. Certainly the teacher may find Q-methodology interesting and instructional without taking the step of computer analysis. The teacher, for example, could ask each student to study his or her final structure and draw conclusions about the relationships of statements. An oral or written discussion could increase student self-understanding.

In this example, however, data were analyzed by Van Tubergen's (1976) QUANL computer program, which Stephen reported as the most widely used program for Q-methodology (p. 204) . Although varimax rotation was employed in this instance, one should note that centroid methods also provide valid and even preferable solutions (e.g. Brown, 1980, 224-239; Stephenson, 1953, 30-46; Thompson, 1962). One advantage is the varimax rotation takes the researcher's judgments out of the solution. Such arguments about various statistical or computer considerations, however, are probably irrelevant to the teacher wanting to use Q-methodology to increase student learning. There are several computer programs (see Stricklin, 1987) available to prepare and analyze Q data: Concourse by Nesterenko and Wilson; PCQ by Stricklin; Stephenson's ROSETTA; QMAP by Timothy Stephen, Rensselaer Polytechnic Institute, NY; Manley's PC program; Brown's JINNI for mainframes; the editor program QSORT by Shih (Brown, 1987), Christopher Barchak's statement program (Q-Writer), McNeese State University, Louisiana; and CENSORT for mainframes and personal computers, by Knabe and Talbott, the University of Iowa. The CENSORT program attempts to build carefully upon Stephenson's premises and appears quite user friendly.

Although different computer programs will yield different information, all use similar principles in interpreting a Q-sort. Each factor will indicate how people cluster together in their response patterns. The teacher will receive correlations of all the variables (people, in the case of Q-methodology). Consider an application of an explanation by Casey and Graham (1988) regarding interpretation:

> In Q-methodology, factor analysis features correlations between each pair of persons (rather than between each pair of items). Each person's array of scores on the [59 in the communication theory example] statements is thus correlated with each other person's array, leading to a [14 x 14 people] celled table [196 cells] upon which the factor analysis is performed. Factor analysis bringing out the underlying similarities in these arrays thus clusters the subjects into like-minded groups (instead of clustering items into factors composed of items which evoke similar responses in the overall group of subjects)....We account for the clustered viewpoints (i.e., factors) by careful examination of the typal arrays of the factors, and here we benefit from the variety of statements from different realms of thought selected for the Q-sample. We reconstruct the Q-sort most typical of each factor, which is the pooled outlook of those subjects (and of other subjects contributing to that factor). This outlook reflects how an identifiable segment of public opinion actively thinks about the issue in the sense of wrestling with, assembling, and juxtaposing various ideas, notions, concepts, factual observations, epigrams, and symbols into a meaningful viewpoint. p. 7.

It is the analysis of the array of each factor that gives the essence of understanding the results. As Brown (1986c) clarified: "The ultimate test of a factor in Q is not the number of statements, but whether the Q sorts (hence the factors which they produce are <u>schematical</u>, i.e., whether each Q sort makes sense and is homologous with what the person wants to say" (p. 97). In other words, the teacher is <u>not</u> free to interpret a factor any way he or she pleases. The interpretation must hold up with all elements of thee factor. The interpretation must be congruent!

A principal component factor matrix will indicate how each person loaded on each factor. The factor loadings and percentages of total variance accounted for by each factor will give the teacher information regarding how many factors represent the best solution. It may, for example, take several factors to account for much variance, but the teacher may chose to limit the solution to four factors, for example, to make interpretation of the factors easier for students. Students seem to have difficulty interpreting the subtle differences between many factors. On the other hand, all students may load significantly on just two factors, as in the communication theory class example, indicating that a two factor solution is the best. In this illustration, a two-factor solution accounted for 34% cumulative percentage of the total variance. To determine significant factor loadings the teacher can compute the standard error for a zero correlation coefficient: SE = 1//n, where n = number of statements (Mauldin, 1987, p. 3).

In this situation, descending array of z-scores and item descriptions for the two factor solution and a principal components factor matrix were

distributed to students. The teacher explained the basics of interpreting results, then asked each student to study the results and write an interpretation. During a later class session, each student wrote on the board a few key words or phrases from their interpretation of the two factors. The class as a whole then discussed the factors. By looking at the descending array of z-scores and item descriptions for each type, the teacher and students examined how each type would ideally arrange statements from the most agree to most disagree. From that information, a synopsis of each type can be made. Additional data such as consensus item (where all types are in agreement) and differences between types (showing trends by statements) is also helpful in making interpretations. I found that although individual evaluation may differ significantly, if students analyze the data before class, they are able to reach consensus on interpretation during class discussion. Below is a brief synopsis of the two factor types in this case.

Type One: The Typical Communicator Eleven students loaded significantly on type one ($p<.01$ level). These students felt that the ability to communicate effectively is the key to success. They considered the basic concepts of exchange theory as important. They felt that the opinions they held about a subject predispose them toward that subject. They failed to see a relationship between good writing and good speaking skills. They strongly disagreed with the statement that "the system as a whole is more important than individual parts of a system," and they did not believe that the world can be broken down into independently existing parts. In addition, they did not think it possible to establish laws to predict human behavior as we have done with physical laws.

Insert Table Two About Here

Type Two: The Nonverbal Communicator. The importance of openness and nonverbal communication seemed to be major elements in this type. The two most agree statements for type two were that "all social interactions involve some form of exchange or anticipated exchange," and "Open communication is like an open window shade. One can't block out others' ideas." These students considered several concepts important in communication: the influence of society on behavior, nonverbal cues, feedback, and social relations. They disagreed with the statement that "verbal communication plays a larger role in human interaction than nonverbal." In fact, they did not find it difficult to imagine how we could communicate in a fully human way without using the verbal code. They felt that various forms of research are valid, and that research should be an active process. Three students loaded on this type.

Insert Table Three About Here

Computer Apprehension Example

During my next communication theory class, I intended to use the same Q-sort to accumulate more data. It was soon obvious, however, that the process of creating the Q-sort is extremely important to the student

learning process. In this case, we discussed several more narrow topics we might study, and decided on a study of computer apprehension. Students followed the same basic process as explained above, except there was less emphasis on statements from the literature and more emphasis on statements from the interview process. I selected the statements most representative of aspects of computer apprehension based and finalized a 44 statement Q-sort that was administered to 63 people (the Q-sort and more complete interprettion of data may be obtained from the author). A brief description of factors is furnished here to show a different type example. If the factors in this three factor solution were real people, rather than prototypes, they might describe themselves like this:

The Computer Enthusiast. Computers have made my work much easier. I'm not that scared about computers because I like experimenting on the computer. I'm not afraid of computers, and I think men and women have equal aptitude on the computer. I have trouble understanding why some people are afraid of computers, but maybe it's because they're afraid of looking foolish in front of someone else. I probably use and enjoy using thee computer more than other types. I think thee computer is an effective way to communicate. I was never really hesitant about thee computer, except that I wondered how it might affect my job. Computers are great, and I'm good with them.

The User Skeptic. I like experimenting with computers, and I'm not really scared of computers. When I go somewhere and the computers are "down" so I can't get anything accomplished, it really upsets me. I'm good with computers and they make me feel good about myself. But I'm concerned about how computers might control us and the prospect of losing data. Plus, all that computer jargon seems unnecessary. I'm not really concerned about computers taking over my job, or my ability to wreck thee equipment, or even what other people think about my mistakes on the computer. Maybe I'm a skeptic, and I don't care for the way some people think computers are the answer to everything.

The Talker. I'm concerned about the way computers may change our communication with people. I think computers will make some people talk to each other less. Computers are not the most effective form of communication. Computers don't make me feel good about myself. I'm concerned that as computers become more widespread, the ability to communicate to other people by face-to-face conversation will decrease proportionately. Computer technology is moving too fast. I think it's scaring people away. I'm more comfortable doing things thee old-fashioned way. I think computers will make some people talk to each other less. Because of computers, people don't talk to each other like they used to do. Some people tend to get tied to machines and forget to be humans. They forget to look at humans. I'm still not totally comfortable around computers. If computers were more available to me on a daily basis, I might not be so afraid of them. Computers do little to enhance my work or my self-concept.

Discussion

In the words of American writer Elbert Hubbard: "You can lead a child to college but you cannot make him think" (In Esar, 1949). Over the years, I have used Q-methodology as a research tool in a variety of

contexts. After one study using students, several students mentioned on their course evaluation forms that the Q-sort was "the most interesting" and the "most thought provoking" part of the course. During a mid-semester and final evaluation of an interpersonal communication course using Q as the major instructional technique, the students indicated that they considered the use of Q to be a valuable and interesting learning tool. With "10" representing the learning techniques used in the best class and "1" representing techniques of the poorest class they have had in college, the mean student response rating of Q-methodology was "7." Some example student comments included: "It produced a sense of accomplishment because the whole study--from start to finish--was our own doing....It is a chance to sort out one's thoughts....I really could relate to the factors that I fell into....It makes you really dig deep....I'll never forget these Q studies because they forced me to sit down and take some time to evaluate who I am and what I believe....Made me think about my values....I felt overwhelmed by all the information....The Q studies made me feel better about those around me as well as myself....Very interesting and fun....They really did make me think....I was involved in the process."

The interpersonal students appeared to learn the basic principles of Q-methodology in addition to communication principles and did so in an interested and involved manner. The use of Q seemed more creative and applied than traditional teaching methods. After success with those students, Q-methodology has met with a favorable response from students in subsequent courses. In fact, students in this communication theory example gave one of the highest overall course ratings I have received, and they rated the use of Q-methodology as having higher "learning value" and higher "interest value" than the use of games and simulations.

Q-Methodology is unique, interesting, and successful in providing students with a means for studying the subjective nature of things. As Stephen (1985) explained, "Q-methodology is one of the least known and least understood quantitative methods" (p. 194). We know even less about using Q-methodology in teaching and learning. But in this case, undergraduate students--with little understanding or bias regarding research methods--seem to grasp the technique in a relatively easy, yet sophisticated manner. In a class about communication theory, Q-methodology enabled students to catch the essence of abstract ideas in a concrete way. In addition, students were able to structure their thinking by the use of Q-methodology.

Those teachers who wish to employ the method in the classroom may find additional readings helpful (e.g. Brown, 1980; Bem & Funder, 1978; Brown, 1971; Cragan, 1981; Stephenson, 1980; and Operant Subjectivity, which is an inexpensive journal that deals exclusively with Q research). Information about many computer programs, the Operant Subjectivity Journal, and the annual meeting of the Institute for the Scientific Study of Subjectivity is available from Steven R. Brown, Political Science Department, Kent State University, Kent, Ohio 44242-0001, phone 216-72-2060 (BITNET network contact sbrown@kentvm). For those who prefer to pay to have someone else run the data before investing in a program, they can find help from Donald J. Brenner, Director, The William Stephenson Research Center, School of Journalism, University of Missouri,

Columbia, Missouri, 65205 (314-882-7763). Even without doing the computer analysis, students find the sorting method one that encourages them to think. In this day in which faculty are trying to increase the use of critical thinking processes of students, Stephenson's Q-Methodology appears to be a teaching technique "made to order." What can Q-methodology do for communication teachers? It can allow us to join our students in the search for understanding subjectivity.

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Table One
Statement Distribution

Feeling:	Most Disagree				Neutral Area				Most Agree		
Category:	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Statements:	2	3	6	7	7	9	7	7	6	3	2

Table Two
Type One Items Greater Than All Others*
(Difference Z-scores Greater Than +1)

1. Individuals join groups to gain information about themselves. I wonder whether we learn from others (particularly intimate things about ourselves) through intimate talks, or perception through another person's eyes, or some other way.
2. A new approach based on rules theory...seems to be emerging. It is too early to tell whether this trend will be influential.
3. People usually communicate with a purpose in mind.
4. Rewards and punishments can motivate certain types of behaviors and behavior patterns.
5. By telling people a standard is not acceptable to us we can cause them to possible reward or punish themselves for their behavior.
6. Perception or awareness of the characteristics of other people is similar to the perception of any natural object.
7. Individuals have certain personal constructs which affect how we form impressions of others, through personal constructs and cognitive complexity.
8. We are not knowledgeable (naturally) of ourselves. Our internal ourselves are not clear. Therefore, we generally gain knowledge of ourselves in the same way we gain knowledge and perceptions of others.

*Some statements are abbreviated to save space.

Table Three
Type 2 Items Greater Than All Others*
(Difference Z-scores Greater Than +1)

1. Open communication is like an open window shade. One can't block out others' ideas.
2. Society is based on individual's actions but individuals act as they do because they are members of society.
3. No theoretical model can ever be proved; it can only be falsified.
4. What makes humans unique is their nature as sign producers and social beings.
5. By presenting opposing arguments to my opinions, a public speaker can change my attitudes, and ultimately my actions.
6. I can control my own nonverbal communication.
7. Good writers are seldom good speakers and vice versa.
8. The wealth of nonverbal cues available in smaller face-to-face interactions is missing in other forms of communication.
9. Decentralized leadership has a positive effect on the satisfaction level of the members within the group.
10. The ability to use grammar is part of our biological makeup that is refined through experience.

*Some statements are abbreviated to save space.

Appendix 1
Instructions Given to Students

Instructional objectives in using Q-methodology include

1. To allow students to contribute to the advancement of knowledge, which includes examining theories found in the literature.
2. To apply effective communication skills by interviewing communication professionals regarding their views about communication theory.
3. To stimulate classroom discussion.
4. To encourage students to structure their thoughts and feelings about communication theory and therefore examine their thinking patterns about theoretical issues.
5. To compare classmates in order to provide insight into each student's feelings about communication.
6. To move each student toward the development of his or her own theory of communication.
7. To teach students a scientific method for investigating and solving problems.

The instructional steps in using Q-methodology will include:

1. Students will select statements from their textbook or related readings.
2. The teacher will select a preliminary list of statements and give it to students for an initial reaction.
3. Students will conduct interviews with communication professionals to obtain additional statements.
3. The teacher will select statements that best represent a variety of feelings and opinions about the topics under discussion.
4. Students will sort the statements by actually completing a Q-sort.
5. The teacher will use a computer program to analyze the Q-sorts.
6. The teacher will give the students the computer results for their analysis. Students will conduct their analyses individually, then discuss their interpretations as an entire class.